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Author(s): John C. Berry

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MEDICINE IN JAPAN: ITS DEVELOPMENT AND PRESENT STATUS

By John C. Berry, M.D., formerly Medical Director of Dōshisha University Hospital, Kyōtō

The earliest historical period of Japanese medicine is shrouded in mystery and may properly be termed the mythical period. As in Egypt, Greece and other ancient countries, it was the age of the "demi-gods." It extends from the dawn of Japanese history, supposed to be 700 B. C. to about 100 B. C., a period of six hundred years. Early traditions attribute the source of the first knowledge of the cure of disease to the teachings of two dieties, known in Japanese history as, O-Na-Muchi-No-Mikoto and Sukuna-Hiko-Na-No-Mikoto. It is hinted by modern scholars that these earliest ideas of the treatment of disease originated in China and Korea. Still the medical knowledge of the period has always been popularly regarded as emanating wholly from the Japanese themselves.

Tradition informs us that experiments were early made upon monkeys to determine the action of certain vegetable substances possessing supposed remedial virtues, of which thirty-seven were thus tested and employed in sickness. These consisted chiefly of roots and the barks of trees and represented the sum total of the Japanese materia-medica of that period. Attempts at the study of anatomy were made, monkeys being dissected in the hope of thus learning the arrangement of the organs of the human system. The knowledge of anatomy thus gained was but little advanced, save in very limited circles, for a period of about two thousand years. Observations were also made as to the age to which people lived and the tradition is preserved, "that few lived beyond one hundred years."

This was looked upon as the age of pure Japanese medi-

cine and its principles were jealously defended when, in later years, the Chinese system was introduced. In this earlier age no attempt seems to have been made to investigate the *causes* of disease, the whole range of treatment being entirely symptomatic. Yet the profession of medicine was held in high esteem, the medical men of the country being mostly related to the imperial house and to noble families. In the reign of the twelfth emperor of this "divine age" the custom was changed and "elderly men of experience" were allowed to assume the responsibility of treating disease; while those unable to pursue other vocations might be employed in digging medicinal roots and in gathering herbs. It is further said that when monkeys were kept for the scientific purposes referred to, persons of both sexes, infirm from birth and who could not do regular manual labor, were given the task of caring for them.

It is interesting to note that the Japanese, in that early age, anticipated the modern scientific use of the monkey for the testing of drugs. It has long been recognized by modern men of science that there is no animal that so nearly resembles man, in the effects produced by drugs, as the monkey.

It is of equal interest to note that the four elements, wind, fire, water and earth, were employed to explain the various phenomena of human life. Tradition reports the second emperor as saying nearly six centuries before Christ; "It is discovered by the great skill of the heavenly gods that the human body is made of four elements, wind, fire, water and earth, and by their combination to possess the body with the soul." This was also the teaching of Empedocles, the Greek philosopher, 450 B. C.

The same theory was held later by Egyptian and Grecian philosophers, one of whom, Hippocrates who lived two hundred and fifty years later, originated the science of modern rational medicine. He held that the body is made up of four elements and from these are derived the four humors—blood, phlegm, bile and black bile, these humors, in turn, determining the temperament of the individual in which one or the other may predominate—sanguine, phlegmatic,

bilious and melancholic—a classification used by westerners, to some extent, even today.

The Japanese regarded the cause of disease as originating either from the spirit of air or of water.

The country is of volcanic origin and volcanic upheavals of varying severity have been of frequent occurrence during its history. These seismic disturbances have produced numerous hot medicinal springs in different parts of the country and these were resorted to for the treatment of diseases in this early age, as at the present time.

Cold water was early employed in the treatment of fevers but the use of this remedy was later abandoned for a period of seven hundred years, namely from the twelfth to the nineteenth century A. D. Mingled with these more rational methods tradition assures us that successful treatment of disease frequently required the exorcism of evil spirits. To what extent this superstition and the religious treatment of disease was due to the later introduction of Buddhism is difficult to determine. It should be remembered that these statements are based upon legendary information as preserved in records dating 712 A. D., at which time authentic Japanese history began.

Among the occult phenomena popularly believed to enter into the ætiology of disease, the superstition of fox possession should here be noted. The animal is supposed to assume human form by placing a skull on its own head, facing the north star and then, by prayers, genuflections and rapid circulatory motions, rapidly take on the human form. As a girl, he is made responsible for many startling tales and experiences.

I well recall the haggard appearance of a young man as he came to the hospital clinic one morning and sitting before me gravely asked to be relieved of his disease of “fox possession.” His story was, that on the previous evening, as he had attempted to go home from a neighbor’s house, his path leading along a ravine between the mountains, the light of his lantern, in some mysterious manner, suddenly went out. Wandering for a while, he discovered a light in the distance, which he took for that of his own home. As

he walked, however, this light receded and finally disappeared. In weariness he sank to the ground. There now appeared to him a beautiful woman, who directed him on his way. She too finally vanished but to his joy the road led to his home.

To dispossess the person of this hallucination is usually the proud work of the priest. He gravely says to the patient, "I will perform for you religious ceremonies and prayers and if you will go to such a temple, offer there your prayers and your offerings, you will immediately be relieved." The result usually verifies the promise—a pure case of mind cure.

The name of this animal seems to have been taken from a legend occurring 545 A. D. Ono, a native of Mino, greatly longed for his ideal of feminine beauty, who finally appeared and became his wife. With the birth of their son was also born a dog in the immediate neighborhood, which, when grown, became intensely hostile to Ono's wife. One day the dog attacked her with unusual fury, when she, in uncontrollable fear, assumed her former shape, leaped over the fence and disappeared *in the form of a fox*. "You may be a fox," cried Ono, as he saw his wife disappear, "but you are the mother of my son and I love you; *Ki-tsu-ne-Kitsune*." And so every night, as the shadows gathered and the dogs were in kennel, she came back and nestled in his arms; hence the name *Ki-tsu-ne*, "Come and sleep."

The second period in the history of Japanese medicine extends from 100 B. C. to 700 A. D. and embraces the period known as the extended introduction of Chinese medicine. This includes Korean medicine many of whose physicians and learned men came to Japan as teachers and as practitioners during this time. Kempfer repeats a legend of the coming of the first foreign physician: In the reign of the Emperor Kogen, 214 to 158 B. C., a physician from China with three hundred young men and an equal number of young women, came to Japan, "his real purpose being to escape the tyranny of his own government." In order to be permitted to leave China, he represented to his emperor that there existed in Japan the medicine of immortality, but so sensitive and tender were the plants from which it

was procured, that it would only yield its virtues when handled by virtuous hands. If, therefore, success was to crown his efforts, he must have the assistance of the company proposed. His request was granted. The place of his landing in the province of Kii is still shown, as also the remains of a temple once erected in his honor, "for having introduced good manners and useful knowledge."

Following the military invasion of Korea by the Empress Jingo Kogo, 201 A. D., increased medical knowledge was brought into the country and this was further increased in later years by the coming of botanists to study the medicinal flora of the country. Later it became the rule to collect these herbs on the fifth day of the fifth month, a custom observed at that time even by members of the Imperial house. The knowledge of human anatomy was shown by the belief that there was a hole in the liver which communicated direct with the heart.

In the sixth century Buddhism was brought to Japan. Shortly after this an epidemic of some skin disease prevailed. Some claimed that this punishment was in consequence of the introduction of the new religious faith, while Buddhist believers claimed it was a punishment from Heaven because of the burning of a Buddhist idol by command of the Emperor. One of the court officials falling sick of the disease was permitted to pray to Buddha for relief, the first act of its kind recorded in the history of Buddhism in Japan. The officer recovered and this led to the use of charms against disease and to the offering of prayers to Buddha for relief from sickness. From that time to the present, Buddhist priests have sought to perform the double duty of priest and physician. Buddhist teaching, too, increasingly emphasized the older theory that all human suffering arose from the discord of the spirits of the four elements, and the treatment of disease, became increasingly a religious rite, and the priest a religious healer.

In 669 A. D. a school of learning was established by the Emperor Tenshi and thirty years later a medical department was added. In this school was taught the Chinese system of internal medicine, *materia-medica*, cultivation and curing

of medicinal plants, acupuncture, massage, diseases of the skin, and bone complaints. The students were chiefly the sons of officials and the entire course of study covered twelve years. An interesting custom prevailed of requiring physicians having official appointments to send to their alma mater their first year's income as an "expression of their gratitude" for their education. This was doubtless a return in part of the allowance made by the government to medical students, that all their time might be devoted to study. Later this "return gift" was fixed at one-tenth of the income from the first year of practice. In 735 A. D. a severe epidemic of smallpox appeared, which led the more observing to carefully study the disease. Though this was known in China as early as the beginning of the Christian era, a full description of the malady was not recorded in Japan until 1323, nearly four centuries after the first accurate description was given of the malady by Rhazas, the Arabian physician.

In 806 A. D. a severe plague visited the country and the friends of "Japanese medical art as taught in ancient times by men and gods" joined in the agitation lest this fact should be forgotten. They finally persuaded the reigning emperor to believe that the plague was a punishment from High Heaven for so completely ignoring the legacy received from earlier patriots, and adopting, instead, the foreign (Chinese) method of treating disease. A medical work was accordingly prepared embracing one hundred volumes, which elaborately set forth the principles and the practise of the more ancient and honored system. This led to a government edict and so severe were the requirements imposed upon physicians, and against Buddhism, that any medical officer of the court who should even meet a Buddhist priest or nun on the street was incapacitated for duty for that day; and should he make a mistake in his prescription or in the writing of his directions, the physician was to be punished by a three years imprisonment and a fine of eighty pounds of copper coin; while should any impurity be found in the medicine given, sixty lashes were to be administered

and a fine of eight pounds of copper coin imposed by the emperor.

This enforced reform, however, was of but short duration and the Imperial successor, Saga, restored the Chinese system with its Buddhistic philosophy, which continued, with varying successes, to the latter part of the nineteenth century.

One remedy given to the west, the moxa, requires notice. Its employment as a means of counter irritation received early emphasis by the Japanese and its use remains at present a popular remedy. The traveler in Japan today will probably be drawn by a jinriksha coolie, who will have several black spots on each side of his spine or along the shin bones, the marks of the application of this remedy. It is made from the flower of *artemisia vulgaris*, popularly known as burning grass or, in Japanese, *mo-gusa*. A work of several volumes was early written, giving the diseases for which treatment by moxa was indicated and the rules for its application, and Kempfer gives an elaborate summary of this treatise under twenty-six different headings. The Dutch, witnessing its value as a counter irritant, adopted it, but instead of using the combustible grass, sought the same end by the use of the hot iron, retaining, however, the Japanese name, *mo-gusa*, the "moxa" of the present day.

As an example of the philosophy underlying the practise of medicine at this time, the conversation between a pupil and teacher may here be quoted: "Why does cold, when taken into the system result in fever?" asked the pupil Kotei of his teacher Ki-Haku, and the latter replied, "Heat is produced at the point of extreme cold. If, therefore, one contracts cold in winter, he suffers from fever in the spring time."

The third period of Japanese medicine extends from about 600 to 1500 A. D. This period simply marks an extension of Japan's intercourse with China and India and the gradual but sure increase of the Chinese system of medicine, during which time it became more highly developed than in the country of its birth. From the middle of the twelfth century,

however, political interests and military exploits claimed increasing attention, leading men to abandon literary and professional pursuits and to seek honor in war. The government now withdrew in part its patronage from learning and priests again came to the front as medical practitioners, some of them ultimately becoming men of learning. The old "natural method," the pure Japanese system, now found many staunch advocates and in time greatly modified and improved the Chinese system. Among these advocates was one Nagata Tokuhon, 1512-1630 A. D., who lived to the age of one hundred and eighteen years. In his practice he sought to work with nature. It is related that a certain nobleman, sick of a fever, called Tokuhon for his medical opinion. "What do you like and dislike most?" was the first question asked by the physician, and to this the sick man replied, "I should like to eat some water-melon, to have all of the clothing removed, to have the screens taken from around me and thus allow a freer circulation of air." This was accordingly permitted and, further, he was allowed to drink cold water as desired, a procedure prohibited at this period by the physicians of the Chinese school. Tokuhon's theory was that nature afforded indications as to what the system most needed. If called to treat a person suffering from any nervous disease, Tokuhon would give little attention to medicinal treatment; but would, rather, search for the causes of the disorder, and often effected a cure by working upon the mind of the patient. For instance, were the patient a farmer and anxious that it should rain, he would speak to him of the probabilities of an approaching storm; were she a woman, anxious because of the long absence of her husband, he would assure her of his speedy return; or if a young girl, converse with her about marriage; and so, sometimes by exciting anger, sometimes sorrow, again by inflicting physical pain, or, indeed, through fear, he would arouse his patients to health, "or to that condition in which he could be best reached by simple medicines." Tokuhon had a large following. In 1543 A. D., forty years after the discovery of the passage around the Cape of Good Hope, a Portuguese merchant vessel came to the

shores of Japan. This was an event of the greatest moment to Japanese medicine and was the beginning of a long, intimate and helpful relation of the Dutch with the Japanese. Up to that time Japan had held relations with Asia only—Korea, China and India. In 1549 Francis Xavier, a Jesuit missionary, began his work and a few years later a hospital was established in connection with this Jesuit mission, and placed in charge of Dr. Lewis De Alemeida. The Nobunaga government treated these Europeans kindly and in 1568 A.D. gave a piece of ground ten acres square in Kyoto, where a church was built and land given sufficient to yield two thousand bushels of rice annually toward the maintenance of the mission. Two medical priests were connected with this church and conducted a dispensary for the poor. To favor the medical side of the work, a still larger piece of land, was placed at their disposal for the cultivation of medicinal and other plants, of which it is said some three thousand different kinds were planted. Climatic conditions favoring their growth, a rich addition was thus made to the medicinal herbs and to the flora of the empire.

A few native students of medicine now attached themselves to these foreign instructors, and surgery, heretofore unknown, began to be practised. The circulation of the blood became better understood. "The Dutch physicians possessed knowledge," declared the historian of the day, "but they were exceedingly rough in applying it; while the Chinese system of medicine is restrained by the conservative teachings of the past." The old Japanese school again forged to the front and included many learned and influential leaders. Literary attainment was now regarded as necessary in the physician, and many scholars minimized the importance of distinctively medical knowledge and claimed that any philosopher in close touch with nature could grasp her secrets and correct the penalties of her broken laws. Numerous books on the treatment of disease were written by laymen, to the utter confusion of the medical knowledge of that day.

In 1750 A. D. the theory of "negative and positive essences and of the five elements" was held and practiced by many

Japanese. The new theory was that disease is a poison and is due to a poison. Poison should be attacked by poison and when we have destroyed the cause of disease, the disease itself disappears. By this process, however, there is loss of *Gen-ki*, or vital spirit, which must be restored and nature aided to resume her sway. Disease was now claimed to come within human control and death from sickness was declared to be due to ignorance rather than to the decree of Heaven. The teachings of Mencius, the student of Confucius, doubtless influenced this theory, he claiming that we can hold Heaven responsible for death of friends only after the utmost means have been employed for their recovery.

The political intrigues of the Jesuits and of the Portuguese now aroused the hatred and indignation of Hideyoshi, the Shogun who had succeeded the Nobunaga reign, and by the harshest possible means he expelled them from the country. Some knowledge of the medical art of these men was preserved by their native students, but the event lessened foreign intercourse and retarded the development of education and of medicine. With the cutting off of intercourse with the Portuguese and the Spanish, the old friends of Japan, the Dutch, now enlarged their relations and these were soon supplemented by the English—in sharp rivalry, with the Dutch for the commerce of the country. This rivalry continued until 1621, when the English withdrew and the Dutch continued their trade at Nagasaki. Here they were always careful to have, among other officers of this branch of the Dutch East India Company, a physician. Among these physicians many were noted for their ability, as Doctors Armans, Schambergen, Hoffmann, and Kempfer.

Christianity was still under the ban of the government and the importation of all religious books was strictly prohibited. This prohibition, however, did not include the study of medicine, and the Japanese interpreters of Dutch were allowed the freest intercourse with the Dutch physicians, in order that they might learn their art. This gave rise to a school of medicine known as the “Orlander” or Dutch school.

As previously noted, the pathology of European medicine at that time differed so little from that of the Chinese (the former being founded upon the doctrine of Hippocrates and Galen that all bodily ills arose from a disturbance of the four humors, blood, phlegm, yellow bile and black bile, while the Chinese ascribed all physical troubles to disturbances of gas, air, blood, and phlegm), that the Chinese school had reasonable ground for contention that the basic principles of their own art were quite as good as those of the West.

Smallpox was an early bane and, in the gregarious habits of the people, wrought terrible havoc among them. Vaccination finally afforded relief and is today compulsory and universal. Doubt existing as to the origin of vaccination in Japan your speaker, in 1884, with the assistance of native members of his hospital staff, made careful inquiry into the early records of its introduction, and learned that this was done by the Dutch physician, Mohniki. The child of his interpreter, Yegawa of Nagasaki, was the first to be vaccinated. A portion of the resulting scab was sent north to a Kyoto physician, Hino-Tozai by name, who vaccinated his grandchild. From this child virus was sent to a physician in the province of Yechizo, from which time the practice rapidly spread and that too, in spite of the strong opposition of the Chinese school and the still potent influence of a year-old proscriptive edict of the Shogun. The beneficent result of vaccination against smallpox was now increasingly recognized and constituted another influence making for the popularity of the western system. Later, in 1858, a vaccination institute was established in Tokyo, which, under the efficient superintendence of the board of health, became one of the best in the world and has, for now more than twenty-five years supplied with virus the surgeons of the Asiatic squadron of the American navy.

Up to the latter part of the eighteenth century the knowledge of western medicine had been gained chiefly from the teaching of western physicians in Japan. At this time, 1771, A. D. Gempaku Sugita (1733-1817) a "descendent of a house of hereditary physicians loyal to the Dutch school," became the possessor of two Dutch anatomical

books. The illustrations in this work differed so widely from the heretofore accepted knowledge of human anatomy as taught by the Chinese school, that Sugita and his friends were anxious for an opportunity to compare the two with human organs. The government was therefore petitioned for its assistance and, in response, permission was granted for the dissection of an executed criminal. As the drawings of the two schools were compared with the organs of the human body, it was at once seen that the resemblance to the Dutch plates was exact, while the teachings of the Chinese school were false. A new era of possibilities for medical science now opened, for the realization of which a knowledge of the Dutch language constituted the key. Accordingly Ryotaku Maeno, Gempaku Sugita, and Junon Nakagawa met at Yeddo on the fourth day of March, 1771, to begin the study of the Dutch language. In three years these men acquired proficiency as translators, "wrote and re-wrote the *Tafel Anatomia* eleven times" and finally, at the end of four years, gave to the country the result of their labors in the *New Treatise on Anatomy*. These men now became the center for the study of the Dutch language and of the history and life of western countries and a few years later, 1808, "when an English ship entered the harbor of Nagasaki contrary to the orders of the Tokugawa government," fuller knowledge of the nations of the west became imperative,—a knowledge which these same scholars and their pupils could now give. Two books, Hokuhen Tanji, *Things Northern*, and Bashin Hiko, *Private Opinions*, soon appeared and in 1811 a translation bureau was established by order of the government and Gentaku Otsuku, a student of Dr. Sugita, placed in charge—the first scholar of western learning appointed to an official position in Japan. The English language now became an object of study, which soon led to the translation of numerous works on general subjects. By the middle of the nineteenth century, a large number of Japanese physicians knew fairly well the literature of European medicine as then developed, and in all branches, save surgery, were fairly reliable practitioners. In spite of this, however, members of the Chinese school had such

influence at court that they secured favorable response to their petition to the government that the practice of western medicine for internal diseases should be prohibited in Japan, on the ground that Europeans and Asiatics were dissimilar in their natures, and the medicine applicable to the one was not suitable for the other. As late as 1849, an order was issued making it necessary to secure government permission for authority to translate books on western medicine; and as the "censorship was in the hands of the government and therefore the friends of the order," a stop was practically put to the further publication of European books on medicine. This edict however, did not include the practice of surgery, which, based upon what had proved to be accurate anatomical knowledge, was permitted to be practiced.

In 1852 Commodore Perry's visit to Japan produced such political and social unrest that popular clamor demanded the "strengthening of all national defenses and general preparation for war." Anticipating a sanguinary conflict, it was deemed a necessity that her surgeons be made familiar with the treatment of gun-shot and saber wounds. Such a work was translated and appeared in 1854 and thereafter the opposition to western medicine, both by the government and by the Chinese school, rapidly lost strength and (in 1857) a hospital and medical school for the teaching of European medicine was established by the government at Nagasaki, the Dutch physician, Dr. Pompevan Meerdervoort, in charge. This event began the fourth period of Japan's Medical History. On the fifteenth of May of that year his inaugural address was given to the assembled students and their friends and Dr. van Meerdervoort began his work as the physician and surgeon of the first hospital established by the government. From this school the two most promising students, namely, Ito Gempaku and Hiyashi Genkai, were selected for Post Graduate work in Holland and were sent thither by the Japanese government—the first students to be sent to Europe for a medical education. Medical science, therefore, was the first to profit by Commodore Perry's visit, and since that time the value placed upon European medicine has been a strong link between the Japan-

ese and the west. Medicine, more than any other science given to Japan as the result of her intercourse with the Occident, has bestowed upon her the greatest benefits, and her people today regard with gratitude and with confidence the work of her medical men as the most signal agency in the country for conserving health, increasing longevity and contributing to the nation's power.

Following this, Japan's relations with America and England became increasingly intimate and English and American medicine exerted a strong influence upon her. The fighting which resulted from the war of the restoration immediately emphasized the need for surgeons, and Dr. William Willis, an English naval surgeon, was engaged to accompany the government forces. Willis was, fortunately, a man of thorough training and of noble character and did much to aid the Japanese.

At the close of the first battle he was informed of the wish of the officers of the army to have the wounded of the government forces treated first, and the wounded of the enemy attended to later. Willis immediately protested against this course of procedure and emphatically declared that he would not allow his instruments to be unpacked unless all the wounded could be treated alike. He carried his point. This spirit of the government only reflected the spirit that had long prevailed in Asia, and is still too frequently seen in China, as regards the treatment of the wounded of the enemy. It was, however, in striking contrast to the order issued by the Empress Jingo Kōgo, when her troops were despatched for the invasion of Korea in the third century, which was, "Spare all who surrender, but destroy all who refuse to yield."

At the close of the war Willis was placed in charge of a large hospital in Tokyo, to which a medical school was attached, and in which he was appointed professor of surgery. He was the first to teach the Japanese aseptic surgery. The methods of English and American surgery thus early took root and the translation of English works were now made and widely read.

It was Japan's first purpose to employ English and Amer-

ican medical teachers, making the English language the medium for instruction, but the presence of a Dutch physician at Nagasaki, who praised the rapid progress of German medicine in the late sixties, greatly influenced the choice of the government for German teachers; while the Rev. Dr. Verbeck, a Dutch-American scholar, a teacher of many of the younger officials and Advisor to the Japanese government, also recommended this latter course. The government, therefore, made known its wish to the German government that medical teachers be furnished. This was at the time, however, of the Franco-German war, when the necessary surgeons could not be spared from the country. At its close, the military surgeons, Müller and Hoffman, were sent to Japan, the first of a series of German teachers who for nearly forty years, continued to occupy professorial chairs at the University.

During the late sixties and seventies a considerable number of American and English missionary societies took up work in Japan. As it was the policy of the larger societies to locate a physician at every central station, it came to pass that a considerable number—eleven—were located in strategic centers of population, and each with a hospital and a surrounding group of dispensaries, became a local center of large medical interests. To these hospitals and dispensaries the native physicians, still practicing the Chinese system and now eager to learn all that was possible of western medicine, would bring groups of patients for treatment, and, on receiving clinical instruction concerning the diseases thus presented and their treatment, would depart to put into practice the knowledge gained.

Dr. James C. Hepburn was the nestor of this number and led us all in consecrated and efficient service. He came to Kanagawa in 1859 but, unable to practice his profession there because of the opposition of the Japanese government, he moved across the bay to Yokohama—a concession for foreign residence. Here he opened a dispensary and being near the capital, his work, especially in surgery, made a profound impression upon the nation. In this he was aided at times by the English naval surgeons.

Students gathered around him both for didactic and clinical instruction and thus his medical work became of the utmost value in allaying prejudice, and winning the confidence of the Nation. In 1873 at the age of sixty years he gave up his medical practice and devoted himself wholly to religious and literary work. He was the first to compile a Japanese-English dictionary.¹ From 1870 to 1880 medical institutions and medical and surgical knowledge rapidly increased. This was greatly favored by a government edict in 1875 to the effect that thereafter medical licenses would be granted only to those who could pass an examination in western medical science. The representatives of the Chinese school were allowed to continue their practice but they made no further effort to re-establish their prestige. They remain, in the writer's memory, as men of rare dignity, representing the best scholarship of their day, and as men, too, who received and who deserved, the respect and the confidence of their fellows. It cannot be doubted that the work of these men, in developing the system of Chinese medicine to a point far beyond what it ever became in the land of its birth, prepared the way for the rapid growth of medical knowledge in the generation following them. They labored as they believed and prepared those who were to follow for a still larger service. All honor to their memory.

In 1872 the writer, as a member of the American Board's Japan mission, took up residence in Kobe and was appointed as medical director of the International Hospital there, and the following year to the Prefectural Hospital in Hiogo. Called to assist in controlling a severe epidemic of beriberi in the prison, he recognized a disease of which little was known and therefore requested permission to perform a post-mortem examination, subsequently using the unclaimed bodies of criminals for dissection. This request was granted

¹Other Medical Missionaries were: Dr. D. B. Simmons, Reformed Church; Dr. Henry Lanning, Episcopal, Osaka; Dr. R. B. Tensler, Episcopal, Tokyo; Dr. Wallace Taylor, American Board, Osaka; Dr. Arthur Adams, American Board, Osaka; Dr. H. Faulds, United Presbytery, Tokyo; Dr. Palm, Edinburgh Medical Missionary Society, Nigata; Dr. W. Norton Whitney, Friends, Tokyo; Dr. McDonald, Canadian Methodist, Shidznoka and Tokyo.

by the central government—the first dissection of a human body made in that prefecture.

In addition to the medical department of the Imperial University at Tokyo, numerous medical centers were rapidly established, while many prefectural governments soon had their own hospital and medical class—in most cases presided over by English, American or German physicians; while as soon as medical graduates were given to the country, these were employed in the larger hospitals first as assistants and then as medical chiefs. Thus in time the services of the foreign physicians became unnecessary.

At present there are three higher medical schools in the country, namely, at Tōkyō in the north, at Kyōtō in the center, and at Fukuoka toward the south. The course of study is four years. The teachers are wholly Japanese, the services of all the foreign teachers having been terminated by resignation or death. The title given to the graduates is *I-gaku-shi*, or Master of Medicine. In addition to the above, there are now eight other medical schools, three supported by the prefectural governments in which they are located and five by the general government. The course of these latter schools is also four years, but the entrance requirements are lower than of the higher schools. Many of the graduates take post graduate work abroad, usually in Germany, while a number have studied in England and in America, some at the expense of the government.

As is well known, the progress of medicine in Japan during the last thirty years has been unique. Physicians take early to specialties and form numerous fraternities for the promotion of the science. Of these there are thirty-nine prominent and prosperous associations, with many other minor organizations, and these deal with all the branches of medicine. They usually hold regular monthly meetings and many of these associations publish their own journals, in which are recorded the results of their investigations. Many of these associations have special laboratories and hospitals, and means for making the newest and most exhaustive researches. Some of these reports are printed

in English, some in German, but most in Japanese. Dr. Kitasato, distinguished abroad for having first discovered the diphtheria bacillus, and regarded in Vienna as having brought distinguished honor to the laboratory where the discovery was made, has one of the more celebrated laboratories, the Bacteriological Institute at Tokyo. Here physicians, both Japanese and foreign, may be taught the latest principles of bacteriology.

There are about fifty medical magazines now published in the country, many of which contain extracts from the latest English, American and German medical literature.

I should add that all the common schools of the country now have physicians appointed to their care whose duty it is to look after the general health and sanitary condition of the pupils and to make thorough physical examinations at fixed intervals. At the last census there were 9664 physicians thus employed.

The laws relating to the practice of medicine and surgery require that every practicing physician or surgeon shall hold a license from the Government. These licenses, except in the case of persons who were in practice before the year 1875, and in certain other cases, can only be obtained upon passing a satisfactory examination in natural philosophy, chemistry, anatomy, physiology, materia medica, general medicine, surgery, ophthalmology, obstetrics and clinical diagnosis. The first four of these branches constitute the first, and the following six branches the second, or *pass* examination. These examinations, which are held semi-annually, in different districts of the several prefectures of the empire, are conducted by a special officer detailed for the purpose. This officer is assisted by a certain number of prominent physicians, chemists, and professors, who are residents of the locality in which the examination is held. The time and place of these examinations are fixed by the home department and applications of candidates are required to be sent in at least one month before the examination takes place. The certificates of candidates must be signed by at least two practicing physicians or teachers of medicine, and no candidate

is eligible for the *first* examination until he has pursued his medical studies for eighteen months, and for the *second*, or *pass* examination, for three years. In case of rejection, the candidate may try again after six months.

The home department is empowered to grant licenses to practice, without examination, to those possessing the diplomas of the government medical schools or of recognized foreign medical schools; also, in special cases, for districts where there may be too few educated physicians, and where, in his opinion, necessity demands the presence of others. An official list of physicians licensed to practice is issued by the home department, while the licenses of those who have given up practice must be returned to the government. The licenses of physicians guilty of grave misdemeanor or of crimes, may be revoked either for a time or permanently, as the home minister on consultation with the central sanitary board may decide.

The last report of the sanitary bureau shows that there were 35,160 physicians in the country, of whom about 15,000 still practice, to some extent, the Chinese system, while about 7000 have graduated from the modern medical colleges. Of these latter, 1791 from the Imperial University at Tokyo, 354 from that at Kyoto and 236 from the Imperial University at Fukuoka. These, 2381, hold the higher title of *I-Gaku-shi*, or Master of Medicine. There are 2898 pharmacists, 26,837 apothecaries, 25,959 midwives and 4034 veterinary surgeons. The latter come under the control of the Agricultural Department.

THE SANITARY BOARD

The importance of hygiene was much appreciated and greatly emphasized in the early seventies, and a thoroughly competent physician, Dr. Sensai Nagayo, sent to America to study our system of medical education and public health. Later he crossed to England, and to Holland for further study and then, returning to Japan, applied himself with great devotion to carry out among his people the knowledge he had acquired abroad. It was he who introduced the

licentiate examination for physicians and the most notable book contributing to their aid at that time was Hartshorn's *Compendium*, which, when translated, was enthusiastically welcomed both by student and government. In 1876 this same Dr. Nagayo was sent to represent Japan at the International Medical Congress held at our Centennial Exposition in Philadelphia. This was the first time that Japan ever sent a representative to a meeting of an international character. The helpful items of information which Dr. Nagayo there found were: the methods of taking statistics of births and deaths; for preventing infectious diseases; problem of water supply; disposal of sewage; treatment of refuse; sanitation in railway carriages; regulations for food and drink, etc. Shortly after his return a severe epidemic of cholera invaded Japan, affording an opportunity for the use of the knowledge he had acquired abroad. But for the urgent demand arising from this fatal epidemic, for these preventive measures he would have experienced difficulty in overcoming conservative prejudice. Dr. Nagayo long remained at the head of the sanitary bureau and within twenty years Japan had made more signal progress in the practical application of sanitary science than any other nation in the same time. This she always acknowledged and still acknowledges as mainly due to the good influence of America and Americans. The value of the science of hygiene as enforced in Japan is especially emphasized by the fact that on the west she is related to countries where sanitary science has been but poorly understood and from which pestilence is so apt to invade Japan. This has emphasized her appreciation of the value of sanitary science; and her recent experience in the Japan-Russian war, in which the medical board had no difficulty in enforcing its requirements among the soldiers, shows how intelligently it is understood and valued by both government and people.

Numerous hygienic societies exist and the Woman's Hygienic Association now has several thousand members. These hold frequent meetings for discussion and for instruction by lectures. Hospitals are numerous, there being some-

thing over 1000 in the empire. Many of these are private; some are charity hospitals; and a few are for lepers.

NURSES

When your speaker, in 1883, proposed the establishment of a nurses' school and the training of Japanese women for the work of nursing, he was met by opposition, both from Japanese and from resident Europeans, on the ground that the status of the Japanese woman was such as to render such a step premature and hazardous.

The first nurses' school, thus proposed, was later established in Kyōtō in connection with the medical work of the American Board and the Dōshisha, and Miss Linda Richards, the first nurse graduated in New England, resigned her position as superintendent of nurses in the Boston City Hospital, to become the superintendent of the Kyōtō school. The first five thousand dollars for this work was given by the Woman's Board of Missions of Boston, in which the Branches of Worcester County took an active part. This Kyōtō school became a model for other schools, was visited by officials and others, and its rules and methods carefully studied. Today, nurses' schools exist in nearly every prefecture of the empire, in connection with private or prefectural hospitals.

The long position of subordination occupied by the Japanese woman, and the training of absolute obedience which she has had, especially fits her for the service of nursing; and though gentle and obedient, yet when brought face to face with any great emergency she manifests remarkable courage and fortitude.

In the early history of the Kyōtō school a striking illustration of this was seen in a medical service arising from earthquake, when, within ten minutes, ten thousand people were killed and fifty thousand injured. To the center of this disturbance I hurried with a corps of native assistants and nurses, where we found a surgical service almost unprecedented in its arduous responsibility. On the third day of that service, when amputating a leg at the knee joint and

about to pick up the arteries for ligation, the distant roar of an approaching earthquake shock was again heard. The large number of patients in the waiting room were hurriedly carried to the yard by their friends, but every nurse and medical assistant braced themselves for the shock, stood bravely by the patient, and steadily performed their respective duties. So too, in the great epidemics of cholera that have swept over the land, and again in the late Russo-Japanese war, these nurses have unflinchingly done their duty, with absolutely no fear of death.

In 1886, Japan was admitted to the Geneva Convention of the Red Cross Society. Today, this society has thirty-one branch offices in Japan, with a membership of more than thirty-five hundred.

At the suggestion of Count Ito there was later created the Volunteer Ladies Nursing Association which during the Japan-China war, became affiliated with the Red Cross Society. Devoted patriotism soon led ladies of rank to become members,—princesses, wives of nobility, of diplomatic staffs, and others, and today this association has forty-one branches and nearly ten thousand members. Ladies of high social standing studied nursing, and their influence has done much to elevate this work throughout the country. Its activity was greatly accentuated during the late national struggle with Russia, their work being to “make bandages and dressings, care for patients, furnish a portion of the personnel of the relief stations, visit hospitals, distribute magazines, and aid patients in their correspondence with friends.” The members of this association fused so perfectly with those of the Red Cross Society, and this in turn with the personnel of the army medical department, that all worked together in perfect harmony.

It is important to bear in mind the work of these auxiliary organizations, so contributory to medical efficiency, when considering the latter work.

This hasty sketch of the long history of a great subject would be incomplete if it omitted to notice the triumph of Japan's Sanitary and Medical service in the Japan-Russian war. As introductory to this, and explaining the obedi-

ence of the Japanese soldier to the orders of the medical board, the peculiar military discipline of the Japanese army must be noted. The relation of the officer to the soldier is that of parent and child: the officer representing the emperor who in turn is the head of the national family. When therefore, the soldier is made acquainted with the wishes of his officer, he is expected to make every effort to carry them into effect.

The hard lessons learned in the earlier Japan-China war, when the rate of mortality from preventable disease was painfully high, emphasized the necessity of organized, scientific sanitation. The whole subject was therefore thoroughly investigated and developed, the best points of military sanitation in the German and French systems appropriated, supplemented by such modifications and additions as would meet Japan's peculiar conditions and needs. In the system as finally developed and in the men who were to carry it into effect, the nation had complete confidence. The soldier when leaving home, was made to fully understand this, and that, should he become disabled from any preventable disease, he would be looked upon by physicians, and by the public, as a credit neither to himself, his family, nor his country. He went to the war to obey orders. He was given his package of aseptic dressing, told to guard it carefully, and instructed how to use it when wounded; he was told to take a bath and put on clean under-clothing before going into battle; to keep a supply of boiled water or tea in his canteen; to drink no water when on the march, except from wells or springs previously labelled as safe by the sanitary officer. And because of his faith and implicit trust in his officers he religiously carried out these instructions. The confidence of the soldier in the commands of the medical officer was enhanced when he saw that the latter was honored by his emperor who bestowed upon him rank and reward for service, and exacted the most perfect harmony of action between the medical and the commanding officers.

Another important fact contributory to medical efficiency was the remarkable liberality of the government in its

allowance for medical supplies, number of medical officers, etc. The grand result was,—an army death-rate lower than that of any nation in any previous war in history,—a death-rate estimated by competent observers on the ground to be less than one-half that of the opposing army. Even with the ratio increased by the large number of deaths arising from beriberi which occurred late in the struggle, the ratio of death from wounds to death from disease was one to one and five-tenths and before that epidemic, 1 to 0.46. In the China-Japan war it was 1 to 12.09.

It should be remembered that this was due not to superior surgical skill, but (1) to the efficiency of the sanitary service and (2) to the intelligent obedience of the soldiers to sanitary requirements. Indeed the surgeons of the Japanese army, though in the main superior to those of the Russian army, were not distinguished for superior surgical skill. But they were humane in their treatment of their men, and to their honor be it said that there was no instance where a surgeon performed an unnecessary operation for the sake of perfecting his surgical technique; and this too, though there were 4517 medical officers in that service.

In closing, I would add but a word as to the present status of Japanese medicine. In the use of the microscope as a diagnostic aid, in pathology, in bacteriology and in ophthalmology, her specialists have attained to great eminence. In the medical treatment of disease and in general surgery, however, extreme conservatism and routine are conspicuous. This has resulted from the fact that for about a quarter of a century, the graduates from the medical department of the Imperial University at Tokyo, who in turn, have become the medical teachers and leading physicians of the nation, were, in internal medicine and in surgery, under the tutorage of but two men. These were eminent in their profession and their pupils were devotedly studious, but the training was from a limited view point and the routine and conservative methods of the present generation can be overcome only by a broader touch with the advanced medical and surgical knowledge of the world.

CONCLUSIONS

1. Centuries before the Christian era, Japan developed a system of medicine which in its close touch with nature, reflected the taste and instinct of a nature loving people. In the centuries which followed, this pure Japanese system was defended against the encroachments of the Chinese system and finally, by modifying it, did much to develop the latter to a point far beyond that which it ever attained in the country of its birth.

2. Chinese medicine, modified both by the Japanese system and by Buddhistic philosophy, maintained a growing influence for nearly two thousand years, until finally supplanted by the European school of rational medicine.

3. The auxiliaries to successful medical effort, viz., sanitary science and trained nurses, stand today on a high plain of development.

4. In microscopy, pathology, bacteriology and ophthalmology, Japanese specialists have attained to a high degree of eminence. In order that the practice of general medicine and of general surgery may be brought to equal eminence, a broad touch with the medical and surgical work of the world is necessary.

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